Trend Study 18-35-02

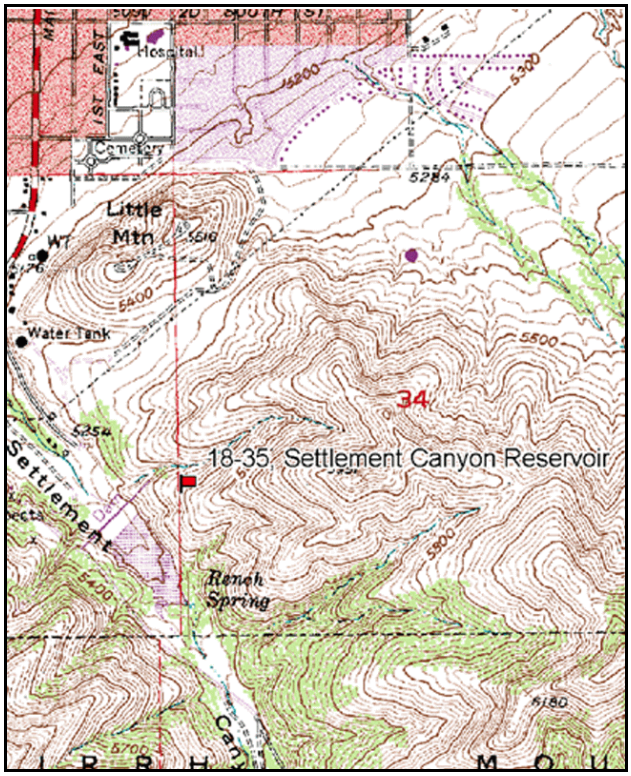
Study site name: Settlement Canyon Reservoir . Vegetation type: Mountain Big Sagebrush .

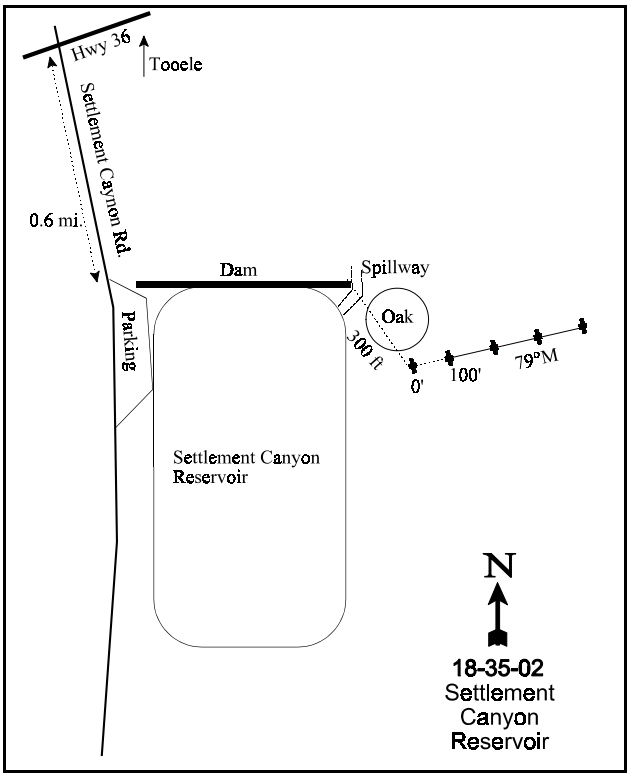
Compass bearing: frequency belt 79 degrees magnetic.

Frequency belt placement: line 1 (11ft & 95ft), line 2 (34ft), line 3 (59ft), line 4 (71ft).

LOCATION DESCRIPTION

From the intersection of Hwy 36 and Settlement Canyon Road in Tooele, drive 0.6 miles to the parking lot at Settlement Canyon Reservoir. Walk across the dam and spillway. From the spillway, walk southeast up the ridge (there is a well worn trail) for 300 foot through an oak patch. Get above the oak and walk along the contour a short distance to the 0-foot stake marked by browse tag #246. There is a rock cairn next to the 0-foot stake.





Map Name: Tooele

Diagrammatic Sketch

Township 3S , Range 4W , Section 33

GPS: NAD 27, UTM 12S 4485178 N 390545 E

DISCUSSION

Settlement Canyon Reservoir - Trend Study No. 18-35

This is a new trend study established in 2002 to replace trend study 18-9, Left Fork Settlement Canyon. The new study, Settlement Canyon Reservoir, is more representative of critical winter range in the area and is more heavily used by deer and elk. It samples a mountain big sagebrush slope located east of the Settlement Canyon Reservoir dam. Slope at the site is 20 to 25% with a west aspect and an elevation of 5,400 feet. Deer use the area heavily and pellet group transect data estimated 90 deer days use/acre in 2002 (223 ddu/ha). Most of the deer pellet groups appear to be from winter use but a few were recent indicating that some deer were still in the area at the time of study site establishment (6/11/02).

Soil at the site is shallow and rocky. Rocks are common on the surface and within the profile. Effective rooting depth is estimated at only about 6 inches with a relatively cool average temperature of about 56° F at 8 inches in depth. This is obviously an underestimate of actual rooting depth but deeper soil penetrometer measurements were inhibited by the rocky soil profile. Soil is a clay loam with a neutral reaction (pH 6.6). Protective ground cover is abundant and there is little exposed bare soil. The erosion condition class was determined as stable in 2002.

The site supports a stand of mountain big sagebrush which had an estimated density of 3,240 plants/acre in 2002. Utilization was moderate to heavy and vigor poor on 13% of the plants sampled. In addition, 38% of the sagebrush sampled were classified as decadent. Most mature plants were vigorous with annual leader growth averaging 2 inches in 2002. Young recruitment is marginal with only 3% of the population consisting of young plants. No seedling sagebrush were found. The only other shrubs found on the site consist of broom snakeweed, creeping barberry, and pricklypear cactus.

The herbaceous understory is abundant, producing nearly 40% total cover. However, species composition is poor. Bulbous bluegrass, a poor value perennial, dominates the composition by providing 64% of the grass cover or 48% of the total herbaceous cover. Bluebunch wheatgrass is secondary in abundance and accounts for 28% of the grass cover. Japanese brome and cheatgrass, two winter annuals, are also fairly abundant but due to drought conditions, produced little cover in 2002. Other perennial grasses, purple threeawn, Kentucky bluegrass, and Sandberg bluegrass, occur infrequently. The forb composition is diverse with 27 species sampled in 2002. Composition is also less than optimal with the most abundant forb consisting of the noxious weed, dalmatian toadflax. It produced 24% of the total forb cover in 2002. Other common forbs include hooker balsamroot, rock goldenrod, and mulesear.

2002 APPARENT TREND ASSESSMENT

The soil is well protected and erosion is minimal. The erosion condition class was determined to be stable. The key browse species, mountain big sagebrush, appears to be showing the effects of drought. An estimated 38% of the population was classified as decadent with one-third of those classified as dying, 420 plants/acre (>50% crown death). No seedlings were encountered in 2002, while young plants accounted for only 3% of the population. This suggests a slight decline in the sagebrush population in the future unless there is a return to normal precipitation patterns and better recruitment of young plants. The herbaceous understory is abundant and diverse, but composition is less than optimal. The low value perennial, bulbous bluegrass, provides 64% of the grass cover or 48% of the total herbaceous cover. The most abundant forb is the noxious weed, dalmatian toadflax.

HERBACEOUS TRENDS --
Herd unit 18 , Study no: 35

Type	Species	Nested Frequency '02	Quadrat Frequency '02	Average Cover % '02
G	Agropyron spicatum	280	88	8.05
G	Aristida purpurea	25	9	.39
G	Bromus japonicus (a)	102	48	.29
G	Bromus tectorum (a)	139	50	1.50
G	Poa bulbosa	389	96	18.62
G	Poa pratensis	1	1	.03
G	Poa secunda	17	7	.14
Total for Annual Grasses		241	98	1.79
Total for Perennial Grasses		712	201	27.25
Total for Grasses		953	299	29.04
F	Agoseris glauca	9	5	.07
F	Alyssum alyssoides (a)	27	11	.08
F	Allium spp.	10	3	.01
F	Ambrosia psilostachya	2	1	.00
F	Artemisia ludoviciana	4	1	.15
F	Astragalus cibarius	24	10	.29
F	Aster spp.	8	4	.19
F	Astragalus utahensis	11	5	.07
F	Balsamorhiza hookeri	44	20	1.40
F	Calochortus nuttallii	17	9	.09
F	Cirsium spp.	10	6	.45
F	Collomia linearis (a)	1	1	.00
F	Comandra pallida	21	10	.29
F	Crepis acuminata	35	17	.17
F	Cymopterus spp.	18	9	.14
F	Eriogonum racemosum	24	13	.22
F	Heterotheca villosa	39	16	.89
F	Holosteum umbellatum (a)	3	2	.01
F	Linaria dalmatica	122	59	2.45
F	Petradoria pumila	42	18	1.54
F	Phlox longifolia	45	25	.22
F	Polygonum douglasii (a)	2	2	.01
F	Ranunculus testiculatus (a)	9	3	.01
F	Tragopogon dubius	8	5	.15
F	Viola spp.	1	1	.00
F	Wyethia amplexicaulis	23	13	1.01
F	Zigadenus paniculatus	6	4	.13

Type	Species	Nested Frequency '02	Quadrat Frequency '02	Average Cover % '02
Total for Annual Forbs		42	19	0.11
Total for Perennial Forbs		523	254	10.02
Total for Forbs		565	273	10.14

BROWSE TRENDS --
Herd unit 18 , Study no: 35

Type	Species	Strip Frequency '02	Average Cover % '02
B	Artemisia tridentata vaseyana	77	12.28
B	Gutierrezia sarothrae	41	1.46
B	Mahonia repens	2	.03
B	Opuntia spp.	22	.33
Total for Browse		142	14.11

CANOPY COVER -- LINE INTERCEPT
Herd unit 18 , Study no: 35

Species	Percent Cover '02
Artemisia tridentata vaseyana	12.17
Gutierrezia sarothrae	.83
Opuntia spp.	.17

Key Browse Annual Leader Growth
Herd unit 18 , Study no: 35

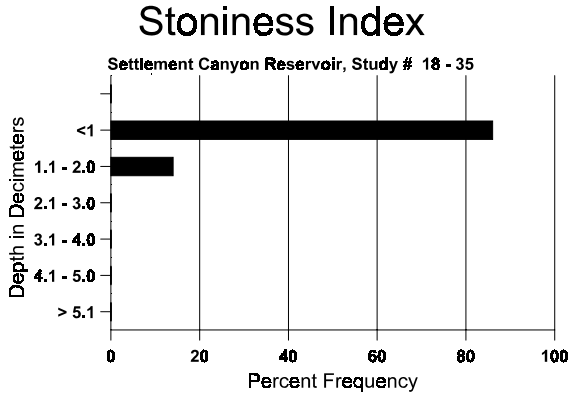
Species	Average leader growth (in) '02
Artemisia tridentata vaseyana	2.1

BASIC COVER --
Herd unit 18 , Study no: 35

Cover Type	Nested Frequency '02	Average Cover % '02
Vegetation	467	47.58
Rock	367	24.67
Pavement	249	6.13
Litter	451	30.61
Cryptogams	129	3.65
Bare Ground	194	4.59

SOIL ANALYSIS DATA --
Herd Unit 18, Study no: 35, Settlement Canyon Reservoir

Effective rooting depth (in)	Temp °F (depth)	pH	%sand	%silt	%clay	%0M	PPM P	PPM K	dS/m
5.5	55.6 (8.1)	6.6	36.9	32.4	30.7	3.2	21.7	259.2	1.0



PELLET GROUP FREQUENCY --
Herd unit 18 , Study no: 35

Type	Quadrat Frequency '02	Pellet Transect	
		Pellet Groups per Acre '02	Days Use per Acre (ha) '02
Deer	51	1175	90 (223)

BROWSE CHARACTERISTICS --
Herd unit 18 , Study no: 35

AGE	YR	Form Class (No. of Plants) 1	2	3	4	5	6	7	8	9	Vigor Class 1	2	3	4	Plants Per Acre	Average (inches) Ht.	Cr.	Total
Artemisia tridentata vaseyana																		
Y	02	3	2	-	-	-	-	-	-	-	5	-	-	-	100			5
M	02	21	31	44	-	-	-	-	-	-	94	2	-	-	1920	14	29	96
D	02	13	18	29	-	-	-	1	-	-	40	-	-	21	1220			61
X	02	-	-	-	-	-	-	-	-	-	-	-	-	-	540			27

% Plants Showing '02	Moderate Use	Heavy Use	Poor Vigor	%Change
	31%	45%	13%	

Total Plants/Acre (excluding Dead & Seedlings) '02 3240 Dec: 38%

AGE	YR	Form Class (No. of Plants) 1	2	3	4	5	6	7	8	9	Vigor Class 1	2	3	4	Plants Per Acre	Average (inches) Ht.	Cr.	Total
Gutierrezia sarothrae																		
S	02	1	-	-	-	-	-	-	-	-	1	-	-	-	20			1
Y	02	6	-	-	-	-	-	-	-	-	6	-	-	-	120			6
M	02	74	-	-	-	-	-	-	-	-	74	-	-	-	1480	7	9	74
D	02	13	-	-	-	-	-	-	-	-	1	-	-	12	260			13
X	02	-	-	-	-	-	-	-	-	-	-	-	-	-	160			8
% Plants Showing '02		Moderate Use 00%				Heavy Use 00%					Poor Vigor 13%					%Change		
Total Plants/Acre (excluding Dead & Seedlings)													'02		1860	Dec:		14%
Mahonia repens																		
M	02	22	-	-	-	-	-	-	-	-	22	-	-	-	440	1	4	22
% Plants Showing '02		Moderate Use 00%				Heavy Use 00%					Poor Vigor 00%					%Change		
Total Plants/Acre (excluding Dead & Seedlings)													'02		440	Dec:		-
Opuntia spp.																		
Y	02	10	-	-	-	-	-	-	-	-	10	-	-	-	200			10
M	02	25	-	-	-	-	-	-	-	-	25	-	-	-	500	5	10	25
D	02	5	-	-	-	-	-	-	-	-	2	-	-	3	100			5
X	02	-	-	-	-	-	-	-	-	-	-	-	-	-	40			2
% Plants Showing '02		Moderate Use 00%				Heavy Use 00%					Poor Vigor 08%					%Change		
Total Plants/Acre (excluding Dead & Seedlings)													'02		800	Dec:		13%